

WE CLAIM:

1. A method of well planning in an automatic well planning system, comprising the steps
5 of:

selecting one or more tasks in a task manager;

verifying by a task dependency a proper order of said one or more tasks;

10

retrieving by said task manager from a task base one or more sets of instructions
associated with said one or more tasks selected in the task manager and verified by said
task dependency;

15 retrieving by said task manager from an access manager one or more sets of input data
associated with said one or more sets of instructions retrieved by said task manager from
said task base;

20 verifying that each set of input data of said one or more sets of input data retrieved by
said task manager from said access manager is received by a corresponding one of said
one or more sets of instructions retrieved by said task manager from said task base;

25 executing, by said task manager, said one or more sets of instructions and using, by said
task manager, said one or more sets of input data during the executing step thereby
generating a set of results; and

recording or displaying, by a task view base, said set of results on a recorder or display
device.

2. The method of claim 1, wherein said one or more tasks selected in said task manager is selected from a group consisting of: risk assessment, bit selection, and drillstring design.

5 3. The method of claim 2, wherein said one or more sets of instructions retrieved by said task manager from said task base is selected from a group consisting of: risk assessment logical expressions and risk assessment algorithms, bit selection logical expressions and bit selection algorithms, and drillstring design logical expressions and drillstring design algorithms.

10

4. The method of claim 3, wherein said one or more sets of input data retrieving by said task manager from said access manager is selected from a group consisting of: input data provided to the risk assessment logical expressions and the risk assessment algorithms, input data provided to the bit selection logical expressions and the bit selection

15 algorithms, and input data provided to the drillstring design logical expressions and the drillstring design algorithms.

5. The method of claim 4, wherein said set of results is selected from a group consisting of: risk assessment output data, bit selection output data, and drillstring design output data.

20

6. The method of claim 1, further comprising the step of:

changing, by a navigation control in response to a user input, said one or more sets of input data retrieved by said task manager from said access manager thereby generating one or more sets of changed input data;

25

re-executing, by said task manager, at least a portion of said one or more sets of instructions and using, by said task manager, said one or more sets of changed input data during the re-executing step thereby generating a second set of results; and

30

recording or displaying, by a task view base, said second set of results on said recorder or display device.

5 7. The method of claim 6, wherein said one or more tasks selected in said task manager is selected from a group consisting of: risk assessment, bit selection, and drillstring design.

10 8. The method of claim 7, wherein said at least a portion of said one or more sets of instructions retrieved by said task manager from said task base is selected from a group consisting of: risk assessment logical expressions and risk assessment algorithms, bit selection logical expressions and bit selection algorithms, and drillstring design logical expressions and drillstring design algorithms.

15 9. The method of claim 8, wherein said one or more sets of input data retrieving by said task manager from said access manager is selected from a group consisting of: input data provided to the risk assessment logical expressions and the risk assessment algorithms, input Data provided to the bit selection logical expressions and the bit selection algorithms, and input data provided to the drillstring design logical expressions and the
20 drillstring design algorithms.

10. The method of claim 9, wherein said second set of results is selected from a group consisting of: risk assessment output data, bit selection output data, and drillstring design output data.

25

11. A program storage device readable by a machine tangibly embodying a program of instructions executable by the machine to perform method steps adapted for well planning in an automatic well planning system, said method steps comprising:

30 selecting one or more tasks in a task manager;

verifying by a task dependency a proper order of said one or more tasks;

retrieving by said task manager from a task base one or more sets of instructions

5 associated with said one or more tasks selected in the task manager and verified by said task dependency;

retrieving by said task manager from an access manager one or more sets of input data associated with said one or more sets of instructions retrieved by said task manager from
10 said task base;

verifying that each set of input data of said one or more sets of input data retrieved by said task manager from said access manager is received by a corresponding one of said one or more sets of instructions retrieved by said task manager from said task base;

15

executing, by said task manager, said one or more sets of instructions and using, by said task manager, said one or more sets of input data during the executing step thereby generating a set of results; and

20 recording or displaying, by a task view base, said set of results on a recorder or display device.

12. The program storage device of claim 11, wherein said one or more tasks selected in said task manager is selected from a group consisting of: risk assessment, bit selection,
25 and drillstring design.

13. The program storage device of claim 12, wherein said one or more sets of instructions retrieved by said task manager from said task base is selected from a group consisting of: risk assessment logical expressions and risk assessment algorithms, bit selection logical

expressions and bit selection algorithms, and drillstring design logical expressions and drillstring design algorithms.

14. The program storage device of claim 13, wherein said one or more sets of input data
5 retrieving by said task manager from said access manager is selected from a group consisting of: input data provided to the risk assessment logical expressions and the risk assessment algorithms, input Data provided to the bit selection logical expressions and the bit selection algorithms, and input data provided to the drillstring design logical expressions and the drillstring design algorithms.

10

15. The program storage device of claim 14, wherein said set of results is selected from a group consisting of: risk assessment output data, bit selection output data, and drillstring design output data.

15 16. The program storage device of claim 11, further comprising the step of:

changing, by a navigation control in response to a user input, said one or more sets of input data retrieved by said task manager from said access manager thereby generating one or more sets of changed input data;

20

re-executing, by said task manager, at least a portion of said one or more sets of instructions and using, by said task manager, said one or more sets of changed input data during the re-executing step thereby generating a second set of results; and

25 recording or displaying, by a task view base, said second set of results on said recorder or display device.

17. The program storage device of claim 16, wherein said one or more tasks selected in said task manager is selected from a group consisting of: risk assessment, bit selection,
30 and drillstring design.

18. The program storage device of claim 17, wherein said at least a portion of said one or more sets of instructions retrieved by said task manager from said task base is selected from a group consisting of: risk assessment logical expressions and risk assessment algorithms, bit selection logical expressions and bit selection algorithms, and drillstring design logical expressions and drillstring design algorithms.

19. The program storage device of claim 18, wherein said one or more sets of input data retrieving by said task manager from said access manager is selected from a group consisting of: input data provided to the risk assessment logical expressions and the risk assessment algorithms, input Data provided to the bit selection logical expressions and the bit selection algorithms, and input data provided to the drillstring design logical expressions and the drillstring design algorithms.

20. The program storage device of claim 19, wherein said second set of results is selected from a group consisting of: risk assessment output data, bit selection output data, and drillstring design output data.

21. An automatic well planning system, comprising:

task manager apparatus adapted for receiving one or more tasks selected by a user;

task dependency apparatus adapted for verifying a proper order of said one or more tasks,

said task manager apparatus retrieving from a task base one or more sets of instructions associated with said one or more tasks received in said task manager apparatus and verified by said task dependency apparatus,

said task manager apparatus retrieving from an access manager one or more sets of input data associated with said one or more sets of instructions retrieved by said task manager from said task base;

5 translator apparatus adapted for verifying that each set of input data of said one or more sets of input data retrieved by said task manager apparatus from said access manager is received by a corresponding one of said one or more sets of instructions retrieved by said task manager apparatus from said task base,

10 said task manager executing said one or more sets of instructions and using said one or more sets of input data during the execution of said one or more sets of instructions thereby generating a set of results; and

task view base apparatus adapted for recording or display said set of results on a recorder
15 or display device.

22. The system of claim 21, wherein said one or more tasks selected in said task manager by said user is selected from a group consisting of: risk assessment, bit selection, and drillstring design.

20

23. The system of claim 22, wherein said one or more sets of instructions retrieved by said task manager apparatus from said task base is selected from a group consisting of: risk assessment logical expressions and risk assessment algorithms, bit selection logical expressions and bit selection algorithms, and drillstring design logical expressions and
25 drillstring design algorithms.

24. The system of claim 23, wherein said one or more sets of input data retrieving by said task manager apparatus from said access manager is selected from a group consisting of: input data provided to the risk assessment logical expressions and the risk assessment
30 algorithms, input Data provided to the bit selection logical expressions and the bit

selection algorithms, and input data provided to the drillstring design logical expressions and the drillstring design algorithms.

25. The system of claim 24, wherein said set of results is selected from a group consisting
5 of: risk assessment output data, bit selection output data, and drillstring design output data.

26. The system of claim 21, further comprising:

10 navigation control apparatus, responsive to a user input, adapted for changing said one or more sets of input data retrieved by said task manager apparatus from said access manager thereby generating one or more sets of changed input data,

said task manager apparatus re-executing at least a portion of said one or more sets of
15 instructions and using said one or more sets of changed input data during the re-execution of said at least a portion of said one or more sets of instructions thereby generating a second set of results,

said task view base apparatus recording or displaying said second set of results on said
20 recorder or display device.

27. The system of claim 26, wherein said one or more tasks selected in said task manager by said user is selected from a group consisting of: risk assessment, bit selection, and
25 drillstring design.

28. The system of claim 27, wherein said at least a portion of said one or more sets of instructions retrieved by said task manager apparatus from said task base is selected from a group consisting of: risk assessment logical expressions and risk assessment algorithms, bit selection logical expressions and bit selection algorithms, and drillstring design logical
30 expressions and drillstring design algorithms.

29. The system of claim 28, wherein said one or more sets of input data retrieving by said task manager apparatus from said access manager is selected from a group consisting of: input data provided to the risk assessment logical expressions and the risk assessment algorithms, input Data provided to the bit selection logical expressions and the bit selection algorithms, and input data provided to the drillstring design logical expressions and the drillstring design algorithms.

30. The system of claim 29, wherein said second set of results is selected from a group consisting of: risk assessment output data, bit selection output data, and drillstring design output data.

31. The method of claim 1, wherein said one or more tasks selected in said task manager comprises a risk assessment task adapted for generating risk information in response to said one or more sets of input data.

32. The method of claim 31, wherein said set of results for said risk assessment task that is recorded or displayed by said task view base on said recorder or display device comprises said risk information, said risk information including individual risks, subcategory risks, and risk categories.

33. The method of claim 32, wherein said individual risks are selected from a group consisting of: H₂S and CO₂, Hydrates, Well water depth, Tortuosity, Dogleg severity, Directional Drilling Index, Inclination, Horizontal displacement, Casing Wear, High pore pressure, Low pore pressure, Hard rock, Soft Rock, High temperature, Water-depth to rig rating, Well depth to rig rating, mud weight to kick, mud weight to losses, mud weight to fracture, mud weight window, Wellbore stability window, wellbore stability, Hole section length, Casing design factor, Hole to casing clearance, casing to casing clearance, casing to bit clearance, casing linear weight, Casing maximum overpull, Low top of cement, Cement to kick, cement to losses, cement to fracture, Bit excess work, Bit work, Bit

footage, bit hours, Bit revolutions, Bit Rate of Penetration, Drillstring maximum overpull, Bit compressive strength, Kick tolerance, Critical flow rate, Maximum flow rate, Small nozzle area, Standpipe pressure, ECD to fracture, ECD to losses, Gains, Gains Average, Losses, Losses average, Stuck, Stuck average, Mechanical, Mechanical average, Risk Average, Subsea BOP, Large Hole, Small Hole, Number of casing strings, Drillstring parting, and Cuttings.

34. The method of claim 32, wherein said subcategory risks of said risk categories are selected from a group consisting of: gains risks, losses risks, stuck pipe risks, and mechanical risks.

35. The method of claim 32, wherein said risk categories are selected from a group consisting of: an average individual risk, an average subcategory risk, a total risk, an average total risk, a potential risk for each design task, and an actual risk for each design task.

36. The method of claim 32, wherein said one or more sets of input data for said risk assessment task is selected from a group consisting of: Casing Point Depth, Measured Depth, True Vertical Depth, Mud Weight, Measured Depth, ROP, Pore Pressure, Static Temperature, Pump Rate, Dog Leg Severity, ECD, Inclination, Hole Size, Casing Size, Easting-westing, Northing-Southing, Water Depth, Maximum Water Depth, Maximum well Depth, Kick Tolerance, Drill Collar 1 Weight, Drill Collar 2 Weight, Drill Pipe Weight, Heavy Weight Weight, Drill Pipe Tensile Rating, Upper Wellbore Stability Limit, Lower Wellbore Stability Limit, Unconfined Compressive Strength, Bit Size, Mechanical drilling energy (UCS integrated over distance drilled by the bit), Ratio of footage drilled compared to statistical footage, Cumulative UCS, Cumulative Excess UCS, Cumulative UCS Ratio, Average UCS of rock in section, Bit Average UCS of rock in section, Statistical Bit Hours, Statistical Drilled Footage for the bit, RPM, On Bottom Hours, Calculated Total Bit Revolutions, Time to Trip, Critical Flow Rate, Maximum Flow Rate in hole section, Minimum Flow Rate in hole section, Flow Rate, Total Nozzle

Flow Area of bit, Top Of Cement, Top of Tail slurry, Length of Lead slurry, Length of Tail slurry, Cement Density Of Lead, Cement Density Of Tail slurry, Casing Weight per foot, Casing Burst Pressure, Casing Collapse Pressure, Casing Type Name, Hydrostatic Pressure of Cement column, Start Depth, End Depth, Conductor, Hole Section Begin
5 Depth, Openhole Or Cased hole completion, Casing Internal Diameter, Casing Outer Diameter, Mud Type, Pore Pressure without Safety Margin, Tubular Burst Design Factor, Casing Collapse Pressure Design Factor, Tubular Tension Design Factor, Derrick Load Rating, Drawworks Rating, Motion Compensator Rating, Tubular Tension rating, Statistical Bit ROP, Statistical Bit RPM, Well Type, Maximum Pressure, Maximum
10 Liner Pressure Rating, Circulating Pressure, Maximum UCS of bit, Air Gap, Casing Point Depth, Presence of H2S, Presence of CO2, Offshore Well, and Flow Rate Maximum Limit.

37. The method of claim 1, wherein said one or more tasks selected in said task manager
15 comprises a bit selection task adapted for generating a sequence of drill bits and other associated data in response to said one or more sets of input data.

38. The method of claim 37, wherein said set of results for said bit selection task that are
20 recorded or displayed by said task view base on said recorder or display device comprise said sequence of drill bits and other associated data.

39. The method of claim 38, wherein said set of results for said bit selection task that are recorded or displayed by said task view base on said recorder or display device is selected from a group consisting of: Measured Depth, Cumulative Unconfined Compressive
25 Strength (UCS), Cumulative Excess UCS, Bit Size, Bit Type, Start Depth, End Depth, Hole Section Begin Depth, Average UCS of rock in section, Maximum UCS of bit, Bit Average UCS of rock in section, Footage, Statistical Drilled Footage for the bit, Ratio of footage drilled compared to statistical footage, Statistical Bit Hours, On Bottom Hours, Rate of Penetration (ROP), Statistical Bit Rate of Penetration (ROP), Mechanical drilling
30 energy (UCS integrated over distance drilled by the bit), Weight On Bit, Revolutions per

Minute (RPM), Statistical Bit RPM, Calculated Total Bit Revolutions, Time to Trip, Cumulative Excess as a ration to the Cumulative UCS, Bit Cost, and Hole Section Name.

40. The method of claim 38, wherein said one or more sets of input data for said bit
5 selection task is selected from a group consisting of: Measured Depth, Unconfined Compressive Strength, Casing Point Depth, Hole Size, Conductor, Casing Type Name, Casing Point, Day Rate Rig, Spread Rate Rig, and Hole Section Name.

41. The method of claim 1, wherein said one or more tasks selected in said task manager
10 comprises a drillstring design task adapted for generating a summary of a drillstring in each hole section of a wellbore in response to said one or more sets of input data.

42. The method of claim 41, wherein said set of results for said drillstring design task
15 that are recorded or displayed by said task view base on said recorder or display device comprise said summary of a drillstring in each hole section of a wellbore.

43. The method of claim 42, wherein said set of results for said drillstring design task
that are recorded or displayed by said task view base on said recorder or display device
20 representing said summary of a drillstring in each hole section of a wellbore is selected from a group consisting of: Hole Section Begin Depth, Drill Collar 1 Length, Drill Collar 1 Weight, Drill Collar 1, Drill Collar 1 OD, Drill Collar 1 ID, Drill Collar 2 Length, Drill Collar 2 Weight, Drill Collar 2, Drill Collar 2 OD, Drill Collar 2 ID, Heavy Weight Length, Heavy Weight Weight, Heavy Weight, Heavy Weight OD, Heavy Weight ID, Drill Pipe Length, Drill Pipe Weight, Pipe, Pipe OD, Pipe ID, Drill Pipe Tensile Rating,
25 BHA tools, Duration, Kick Tolerance, Drill Collar 1 Linear Weight, Drill Collar 2 Linear Weight, Heavy Weight Linear Weight, Drill Pipe Linear Weight, DC OD, Drill Collar ID, Drill Collar Linear Weight, HW OD, HW ID, HW Linear Weight, Drill Pipe OD, Drill Pipe ID, and Drill Pipe Linear Weight.

44. The method of claim 42, wherein said one or more sets of input data for said drillstring design task is selected from a group consisting of: Measured Depth, True Vertical Depth, Weight On Bit, Mud Weight, Mud Weight Measured Depth, Inclination, Casing Point Depth, Hole Size, Footage, Rate of Penetration, Time to Trip, Dog Leg
5 Severity, True Vertical Depth, Pore Pressure without Safety Margin, Bit Size, Upper Wellbore Stability Limit, Lower Wellbore Stability Limit, Openhole Or Cased hole completion, BOP Location, Casing Type Name, Hole Section Name, Conductor, Start Depth, End Depth, On Bottom Hours, Statistical Drilled Footage for the bit, Cumulative UCS, Casing Point, Casing Size, Casing Burst Pressure, Casing Collapse Pressure,
10 Casing Connector, Casing Cost, Casing Grade, Casing Weight per foot, Casing Outer Diameter, Casing Internal Diameter, Air Gap, Casing Top Measure Depth, Water Depth, Top of Tail slurry, Top Of Cement, Mud Volume, and Offshore Well.

45. The program storage device of claim 11, wherein said one or more tasks selected in
15 said task manager comprises a risk assessment task adapted for generating risk information in response to said one or more sets of input data.

46. The program storage device of claim 45, wherein said set of results for said risk assessment task that is recorded or displayed by said task view base on said recorder or
20 display device comprises said risk information, said risk information including individual risks, subcategory risks, and risk categories.

47. The program storage device of claim 46, wherein said individual risks are selected from a group consisting of: H₂S and CO₂, Hydrates, Well water depth, Tortuosity,
25 Dogleg severity, Directional Drilling Index, Inclination, Horizontal displacement, Casing Wear, High pore pressure, Low pore pressure, Hard rock, Soft Rock, High temperature, Water-depth to rig rating, Well depth to rig rating, mud weight to kick, mud weight to losses, mud weight to fracture, mud weight window, Wellbore stability window, wellbore stability, Hole section length, Casing design factor, Hole to casing clearance, casing to
30 casing clearance, casing to bit clearance, casing linear weight, Casing maximum overpull,

Low top of cement, Cement to kick, cement to losses, cement to fracture, Bit excess work, Bit work, Bit footage, bit hours, Bit revolutions, Bit Rate of Penetration, Drillstring maximum overpull, Bit compressive strength, Kick tolerance, Critical flow rate, Maximum flow rate, Small nozzle area, Standpipe pressure, ECD to fracture, ECD to losses, Gains, Gains Average, Losses, Losses average, Stuck, Stuck average, Mechanical, Mechanical average, Risk Average, Subsea BOP, Large Hole, Small Hole, Number of casing strings, Drillstring parting, and Cuttings.

48. The program storage device of claim 46, wherein said subcategory risks of said risk categories are selected from a group consisting of: gains risks, losses risks, stuck pipe risks, and mechanical risks.

49. The program storage device of claim 46, wherein said risk categories are selected from a group consisting of: an average individual risk, an average subcategory risk, a total risk, an average total risk, a potential risk for each design task, and an actual risk for each design task.

50. The program storage device of claim 46, wherein said one or more sets of input data for said risk assessment task is selected from a group consisting of: Casing Point Depth, Measured Depth, True Vertical Depth, Mud Weight, Measured Depth, ROP, Pore Pressure, Static Temperature, Pump Rate, Dog Leg Severity, ECD, Inclination, Hole Size, Casing Size, Easting-westing, Northing-Southing, Water Depth, Maximum Water Depth, Maximum well Depth, Kick Tolerance, Drill Collar 1 Weight, Drill Collar 2 Weight, Drill Pipe Weight, Heavy Weight Weight, Drill Pipe Tensile Rating, Upper Wellbore Stability Limit, Lower Wellbore Stability Limit, Unconfined Compressive Strength, Bit Size, Mechanical drilling energy (UCS integrated over distance drilled by the bit), Ratio of footage drilled compared to statistical footage, Cumulative UCS, Cumulative Excess UCS, Cumulative UCS Ratio, Average UCS of rock in section, Bit Average UCS of rock in section, Statistical Bit Hours, Statistical Drilled Footage for the bit, RPM, On Bottom Hours, Calculated Total Bit Revolutions, Time to Trip, Critical Flow Rate, Maximum

- Flow Rate in hole section, Minimum Flow Rate in hole section, Flow Rate, Total Nozzle Flow Area of bit, Top Of Cement, Top of Tail slurry, Length of Lead slurry, Length of Tail slurry, Cement Density Of Lead, Cement Density Of Tail slurry, Casing Weight per foot, Casing Burst Pressure, Casing Collapse Pressure, Casing Type Name, Hydrostatic
- 5 Pressure of Cement column, Start Depth, End Depth, Conductor, Hole Section Begin Depth, Openhole Or Cased hole completion, Casing Internal Diameter, Casing Outer Diameter, Mud Type, Pore Pressure without Safety Margin, Tubular Burst Design Factor, Casing Collapse Pressure Design Factor, Tubular Tension Design Factor, Derrick Load Rating, Drawworks Rating, Motion Compensator Rating, Tubular Tension rating,
- 10 Statistical Bit ROP, Statistical Bit RPM, Well Type, Maximum Pressure, Maximum Liner Pressure Rating, Circulating Pressure, Maximum UCS of bit, Air Gap, Casing Point Depth, Presence of H2S, Presence of CO2, Offshore Well, and Flow Rate Maximum Limit.
- 15 51. The program storage device of claim 11, wherein said one or more tasks selected in said task manager comprises a bit selection task adapted for generating a sequence of drill bits and other associated data in response to said one or more sets of input data.
52. The program storage device of claim 51, wherein said set of results for said bit
- 20 selection task that are recorded or displayed by said task view base on said recorder or display device comprise said sequence of drill bits and other associated data.
53. The program storage device of claim 52, wherein said set of results for said bit selection task that are recorded or displayed by said task view base on said recorder or
- 25 display device is selected from a group consisting of: Measured Depth, Cumulative Unconfined Compressive Strength (UCS), Cumulative Excess UCS, Bit Size, Bit Type, Start Depth, End Depth, Hole Section Begin Depth, Average UCS of rock in section, Maximum UCS of bit, Bit Average UCS of rock in section, Footage, Statistical Drilled Footage for the bit, Ratio of footage drilled compared to statistical footage, Statistical Bit
- 30 Hours, On Bottom Hours, Rate of Penetration (ROP), Statistical Bit Rate of Penetration

(ROP), Mechanical drilling energy (UCS integrated over distance drilled by the bit), Weight On Bit, Revolutions per Minute (RPM), Statistical Bit RPM, Calculated Total Bit Revolutions, Time to Trip, Cumulative Excess as a ratio to the Cumulative UCS, Bit Cost, and Hole Section Name.

5

54. The program storage device of claim 52, wherein said one or more sets of input data for said bit selection task is selected from a group consisting of: Measured Depth, Unconfined Compressive Strength, Casing Point Depth, Hole Size, Conductor, Casing Type Name, Casing Point, Day Rate Rig, Spread Rate Rig, and Hole Section Name.

10

55. The program storage device of claim 11, wherein said one or more tasks selected in said task manager comprises a drillstring design task adapted for generating a summary of a drillstring in each hole section of a wellbore in response to said one or more sets of input data.

15

56. The program storage device of claim 55, wherein said set of results for said drillstring design task that are recorded or displayed by said task view base on said recorder or display device comprise said summary of a drillstring in each hole section of a wellbore.

20

57. The program storage device of claim 56, wherein said set of results for said drillstring design task that are recorded or displayed by said task view base on said recorder or display device representing said summary of a drillstring in each hole section of a wellbore is selected from a group consisting of: Hole Section Begin Depth, Drill

25

Collar 1 Length, Drill Collar 1 Weight, Drill Collar 1, Drill Collar 1 OD, Drill Collar 1 ID, Drill Collar 2 Length, Drill Collar 2 Weight, Drill Collar 2, Drill Collar 2 OD, Drill Collar 2 ID, Heavy Weight Length, Heavy Weight Weight, Heavy Weight, Heavy Weight OD, Heavy Weight ID, Drill Pipe Length, Drill Pipe Weight, Pipe, Pipe OD, Pipe ID, Drill Pipe Tensile Rating, BHA tools, Duration, Kick Tolerance, Drill Collar 1 Linear

30

Weight, Drill Collar 2 Linear Weight, Heavy Weight Linear Weight, Drill Pipe Linear

Weight, DC OD, Drill Collar ID, Drill Collar Linear Weight, HW OD, HW ID, HW
Linear Weight, Drill Pipe OD, Drill Pipe ID, and Drill Pipe Linear Weight.

58. The program storage device of claim 56, wherein said one or more sets of input data
5 for said drillstring design task is selected from a group consisting of: Measured Depth,
True Vertical Depth, Weight On Bit, Mud Weight, Mud Weight Measured Depth,
Inclination, Casing Point Depth, Hole Size, Footage, Rate of Penetration, Time to Trip,
Dog Leg Severity, True Vertical Depth, Pore Pressure without Safety Margin, Bit Size,
Upper Wellbore Stability Limit, Lower Wellbore Stability Limit, Openhole Or Cased
10 hole completion, BOP Location, Casing Type Name, Hole Section Name, Conductor,
Start Depth, End Depth, On Bottom Hours, Statistical Drilled Footage for the bit,
Cumulative UCS, Casing Point, Casing Size, Casing Burst Pressure, Casing Collapse
Pressure, Casing Connector, Casing Cost, Casing Grade, Casing Weight per foot, Casing
Outer Diameter, Casing Internal Diameter, Air Gap, Casing Top Measure Depth, Water
15 Depth, Top of Tail slurry, Top Of Cement, Mud Volume, and Offshore Well.

20